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AXIOTHELLA CROZETENSIS, A NEW SPECIES OF MALDANID POLYCHAETE FROM CROZET ISLANDS (INDIAN OCEAN)

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Abstract.—A new species of Annelida Polychaeta, *Axiothella crozetensis,* is described from Crozet Islands (46°46.6′S and 50°28.4′E, Indian Ocean). Specimens were collected from depths of 1350 to 1440 m during the MD.08/Benthos Expedition (7 Mar 1976–26 Apr 1976). *Axiothella crozetensis* is compared with all described species of the genus *Axiothella.*

Maldanid polychaetes, called bamboo-worms, are capitelliform, usually long and truncate; the prostomium with nucal organs and a cephalic keel, without appendages, is fused to the buccal segment. Reviews of the family are found in Arwidsson (1907). *Axiothella crozetensis* is the first species of the genus *Axiothella* collected at a great depth. Holotype and paratypes are deposited in the Institute of Fundamental and Applied Research Museum (I.R.F.A.-MAL-047).

Genus *Axiothella* Verrill, 1900

Type species.—*Axiothella catenata* (Malmgren, 1865:190–191).

Diagnosis.—Eighteen to 20 setigers present. Rostrate uncini present in all neurosetigerous segments including the first three neuropodia. Each uncinus with lateral series of teeth above main fang without barbules. Acicula absent. Rim of cephalic plate entire or incised. Anal plaque funnel-shaped; anal cirri of different lengths or as crenulations. Mangum (1962) reviewed the status of the genus *Axiothella* which she placed as a subgenus of *Clymenella* Verrill (Mangum 1962, 1966). This decision did not gain acceptance and authors now recognize the original generic status.

Axiothella crozetensis, new species
Figs. 1–2

Material examined.—Holotype Crozet Islands (19 Apr 1976), Station 70: Sampling DC 280, 46°46.6′S and 50°28.4′E; Paratypes (2) Crozet Islands (19 Apr 1976), Station 70: DC 280, 46°46.6′S, 50°28.4′E. Materials deposited to I.R.F.A. Museum IRFA MAL 047.

Description.—Holotype has 18 setigers and two achaetous preanal segments. Body without color pattern in alcohol. Prostomium longer than wide (1.4 mm long; 0.70 to 0.90 mm wide) with the cephalic plate 0.60 mm long (Fig. 1F). First setiger 1.4 mm long, second setiger 2 mm long, diameter ranging from 0.50 to 0.75 mm. Prostomium well developed with entire rim, not incised. Nucal organs long and parallel; ocelli absent. Buccal segment as long as the first setiger (Figs. 1A, 2A). First setiger depressed anteriorly near fascicle of capillary setae. Notosetae numbering about 15 per fascicle, short and long, are all capillary smooth (Fig.

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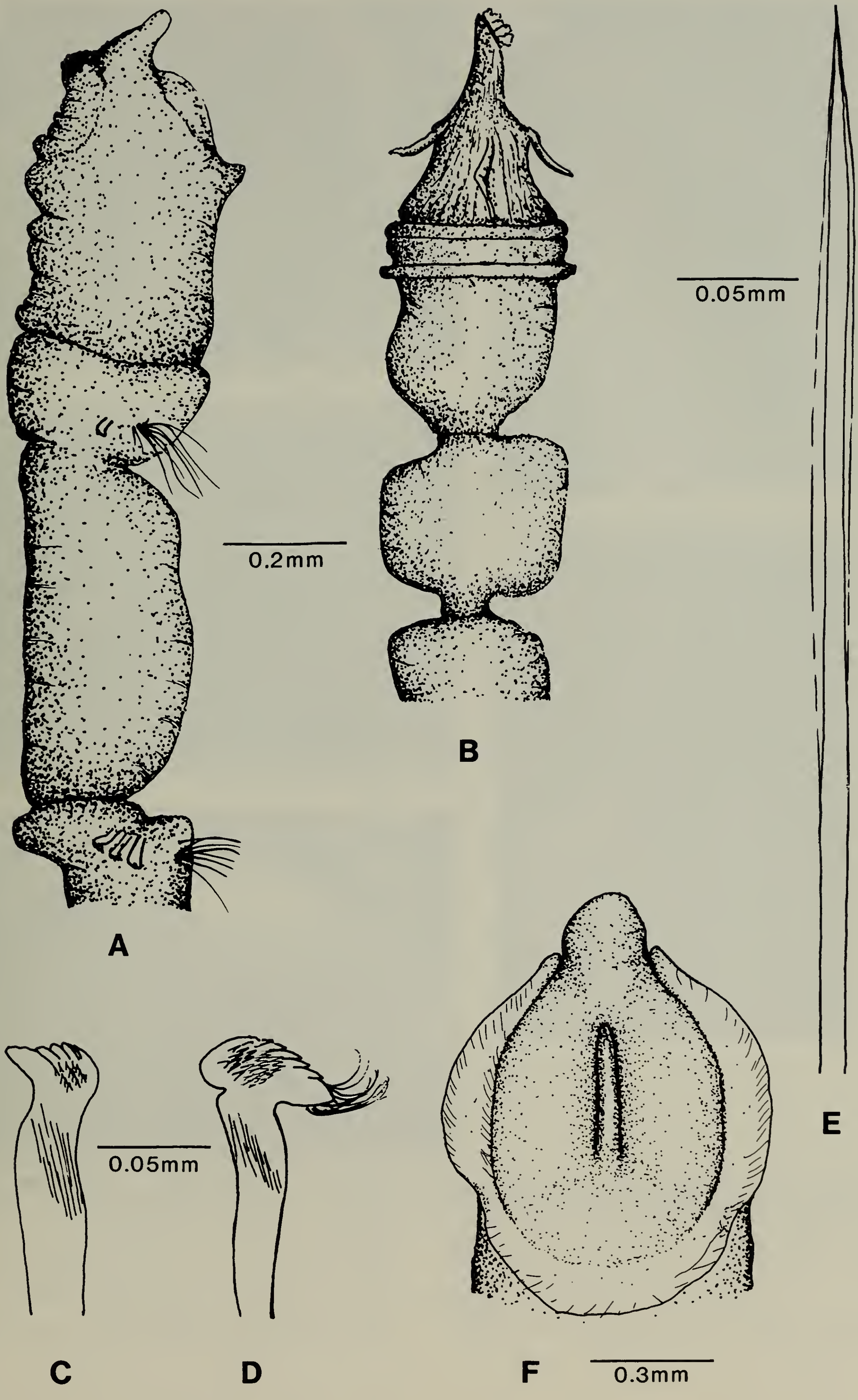
Fig. 1. *Axiothella crozetensis*: A, Anterior region lateral view; B, Posterior region; C, Uncinus from setiger 2; D, Uncinus from setiger 4; E, Capillary setae from setiger 4; F, Cephalic plate frontal view.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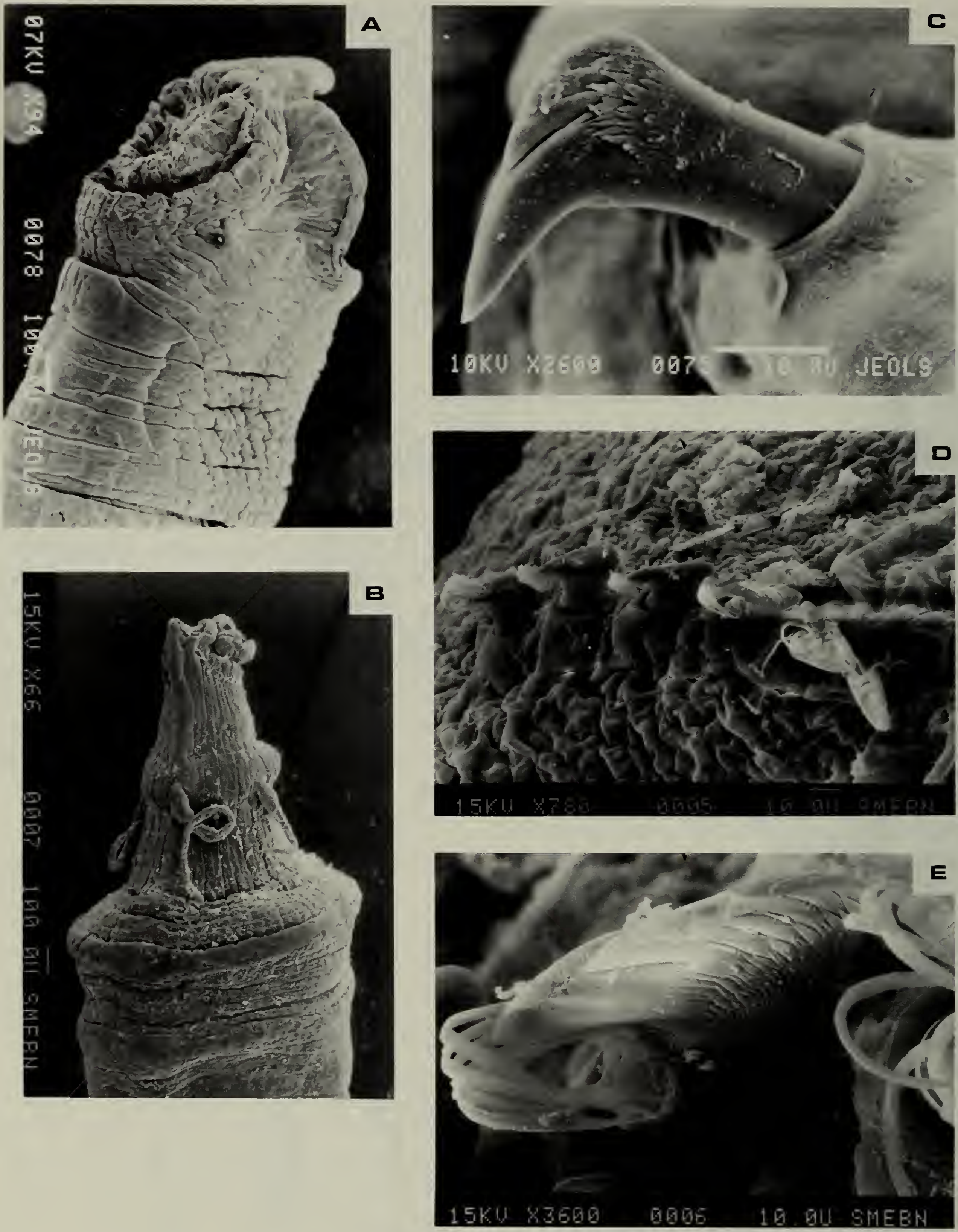
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Fig. 2. Scanning electron micrographs of *Axiothella crozetensis*: A, Anterior region lateral view; B, Posterior region; C, Uncinus from setiger 3; D, Row of uncini from setiger 4; E, Uncinus from setiger 4.

1E). Spinulose, barbelate and bipennate notosetae are absent. Neurosetae of the first setiger are 1–2 uncini per side, each with 4–6 apical teeth without barbules (Figs. 1C, 2C). The second setiger has two or three uncini, the third setiger has three uncini and the fourth setiger six uncini. Uncini from setiger 4 to the end of the worm have barbules below the main fang and one row of six or seven vertical teeth and many smaller ones on each side (Figs. 1D, 2D, 2E). Glandular area absent. The posterior region has two achaetous preanal segments. Pygidium is prolonged posteriorly as a cone with three long anal cirri, each of equal length and nearly the same as the length of the pygidium (Figs. 1B, 2B). The anus is subdorsal with a ventral value.

Discussion.—*Axiothella crozetensis* belongs to the subfamily Euclymeninae, genus *Axiothella* Verrill, 1900, because of the presence of rostrate uncini on the first three neuropodia. Other genera without acicular spines are *Gravierella* Fauvel, 1919 and *Macroclymenella* Augener, 1926, but the number of segments in these genera is more than 30. Species of the genus *Maldanella* McIntosh, 1885 have the first setiger with notosetae only, and those of the genus *Clymenura* Verrill, 1900 have a flanged collar on setiger 4 and a large triangular glandular field on setiger 8.

Axiothella crozetensis differs from other species of *Axiothella* in that it has only one to three uncini on the first three setigers and a prolonged anal cone with three long anal cirri as in the genus *Clymenura* (Table 1). Among the species living in the Antarctic and Subantarctic regions *Axiothella jarli* Kirkegaard, 1959 (Angola, Cape) differs in having from three to seven hooks on the first three setigers. The structure of the pygidium is different with 18 anal cirri alternately long and short. *Axiothella antarctica* Monro, 1930 differs in having three uncini on the first setiger and numerous on the second and third setigers, pygidium with a long single anal cirrus and fifteen shorter cirri. *Axiothella quadrimaculata* Augener, 1914 has numerous uncini on the first three setigers, only one achaetous preanal segment and also differs in lacking anal cirri. Hartmann-Schröder & Hartmann (1984) found two different species of *Axiothella* sp. at Murat Bay, Australia: *Axiothella* sp. A has uncini with five teeth and short barbules and *Axiothella* sp. B has six teeth and long barbules. This species was also found at Blanche Harbour, Australia (Hartmann-Schröder 1985).

Axiothella crozetensis has been found at depths exceeding most records given for other species of *Axiothella* living in the intertidal zone except *Axiothella constricta* Claparède, 1868 at 35–750 m (Tarente) and *Axiothella catenata* Malmgren, 1865 at 10–900 m (Arctic) (Table 1). *Axiothella quadrimaculata* lives in southwest Australia at 3 to 12.5 m on rocks or sand (Augener 1914), at Kerguelen Islands at 20–50 m (Monro 1939), in South Africa at 0–54 m (Day 1961) and at Marion and Prince Edward islands on the shore with ascidians and amphipods (Day 1971). *Axiothella crozetensis* was dredged from 1350 to 1440 m in mud flats with associated fauna of Annelida Polychaeta including *Nephtys hombergii, Trypanosyllis gigantea, Ampharete kerguelensis* and *Melinna cristata.* Morphologically and ecologically these two species differ accordingly: *Axiothella quadrimaculata* lives on rocky bottoms near the shore from 0 to 54 m and *Axiothella crozetensis* lives in mud flats at a depth of about 1400 m. These two species differ from others species of *Axiothella* by the structure of the pygidium. Based on this character, the genus *Axiothella* is in need of revision. *Axiothella catalinia* (Hartman 1969) was transferred to *Maldanella* by Kudenov and Read (1978) because of the absence of uncini on the first setiger, and *Clymenura brasiliensis* (Mangum 1966) must be referred to *Axiothella.*

Habitat.—Subantarctic, Crozet Islands

Table 1.—Species of the genus *Axiothella* Verrill, 1900 (N: numerous uncini).

Species	Distribution, depth (m)	Number of setae setigers 1 – 2 – 3	Achaetous segments	Pygidial cirri
A. antarctica Monro, 1930	Antarctica, 200–344	3 – N – N	5	1 long cirrus, 15 short cirri
A. australis Augener, 1914	Australia, India, 3–12.5	N – N – N	2	7–11 long, 23–30 short cirri
A. brasiliensis Mangum, 1966	Brazil, 1–12	4/6 – 4/6 – 3/5	2	alternately short and long
A. catenata Malmgren, 1865	Arctic, 10–900	8 – 9 – 15	4	22 alternately short and long
A. cirrifera Langerhans, 1880	Madeira, ?	1 to 6	2	1 median cirrus, 14 papillae
A. constricta Claparède, 1868	Italy, 35 to 750 m	N – N – N	3	1 long cirrus, numerous short
A. jarli Kirkegaard, 1959	Angola, Cape, 35–100	3 – 6 – 7	2	18 alternately short and long
A. mucosa Andrews, 1891	United States, Intertidal	12 – N – N	3/4	20 to 30 short and long
A. obockensis Gravier, 1905	Red Sea, India, Intertidal	N – N – N	2	1 long cirrus numerous short
A. quadrimaculata Augener, 1914	Subantarctic, 11–50	N – N – N	0/1	without cirri
A. rubrocincta Johnson, 1901	United States, Intertidal	N – N – N	2/3	1 long cirrus, 18/30 short/long
A. serrata Kudenov and Read, 1978	New Zealand, Intertidal	6 – 7 –10	0	1 long cirrus, 21 to 42 cirri
A. somersi Verrill, 1900	Bermudas, Intertidal	3/4 – 4/5 – 6/8	2	24 alternately short and long
A. tambalagamensis Pillai, 1961	Ceylon, ?	N – N – N	0	numerous cirri, 13 papillae
A. zetlandica McIntosh, 1915	North Sea, 110–183	2/3 – 4 – 4	?	44 alternately short and long
A. crozetensis, present work	Crozet Island, 1350–1440	1/2 – 2/3 – 3	2	3 long cirri
A. sp. Wesenberg-Lund, 1949	Iranian Gulf, 71	25 – 25 – 25 no accessory teeth	?	?
A. sp. Imajima, 1963	Kamchatka, 68	10 – N – N	?	?
A. sp. Wolf, 1984	Gulf of Mexico, 19–43	2/3 with barbules	1	1 long cirrus, 20–24 short
A. sp. Hartmann-Schröder and Hartmann, 1984	Australia, ?	1 to 4	2	1 long cirrus, 15 short cirri

(South of Penguins Island) from 1350 to 1440 m in mud flats.

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Literature Cited

Andrews, E. A. 1891. Report upon the Annelida Polychaeta of Beaufort, North Carolina.—Proceedings of the United States National Museum 14:277–302.

Arnaud, P. M., & G. Hureau. 1979. Compte-rendu de la campagne MD.08/Benthos (7 mars–26 avril 1976).—Comité National Français des Recherches Antarctiques 44:1–38.

Arwidsson, I. 1907. Studien über die scandinavischen und arktischen Maldaniden nebst Zummerstellung der ubrigen bisher bekannten Arten dieser Familie.—Zoologischen Jahrbüchern Suppl. 9:1–308.

Augener, E. A. 1914. Polychaeta II. Sedentaria. Die Fauna Südwest—Australiens.—Herausgeg. von W. Michaelsen und R. Hartmeyer 5:1-170.

Claparède, C. 1868. Les Annélides Chétopodes du Golfe de Naples.—Mémoires Soçiété Physique, Genève 19:313–584.

Day, J. H. 1961. The Polychaete fauna of South Africa. Part 6. Sedentary species dredged off Cape Coast with a few new records from the shore.—Journal of the Linnean Society of London 44: 463–560.

———. 1971. Polychaeta. Pp. 384–390 *in* E. M. van Zinderen Baker, Sr., J. M. Winterbottom, & R. A. Dyer, eds., Marion and Prince Edward Islands. A. A. Balkema, Capetown, 427 pp.

Gravier, C. 1905. Annèlides Polychètes de la Mer Rouge. Cirratuliens Amphicténiens, Terebelliens, Maldaniens.—Bulletin du Museum Histoire Naturelle de Paris 7:319–327.

Hartman, O. 1969. Atlas of sedentariate polychaetous annelids from California. Allan Hancock Foundation, University of Southern California, Los Angeles, 812 pp.

Hartmann-Schröder, G. 1985. Zur kenntnis des Eulitorals des australischen küsten unter besonderer Berücksichtigung des Polychaeten und Ostracoden. Teil 11. Die Polychaeten der antiborealen Südküste Australiens (zwischen Port Lincoln im Westen und Port Augusta im Osten).—Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut 82:61–99.

———, & G. Hartmann. 1984. Zur kenntnis des Eulitorals der australischen küsten unter besonderer Berûcksichtigung des Polychaeten und Ostracoden. Teil 10. Die Polychaeten der antiborealen Südküste Australiens (zwischen Albany im Westen und Ceduna im Osten).—Mitteilungen aus dem Hamburgischen Zollogischen Museum und Institut 81:7–62.

Imajima, M. 1963. Polychaetous annelids collected off the west coast of Kamchatka. II. Notes on species found in the collection of 1959.—Publications of the Seto Marine Biological Laboratory 11(2):345–372.

Johnson, H. P. 1901. The Polychaeta of the Puget Sound region.—Proceedings of the Boston Society of Natural History 29:381–437.

Kirkegaard, J. B. 1959. The Polychaeta of West Africa.—Atlantide Report 5:7–117.

Kudenov, J. D., & G. B. Read. 1978. *Axiothella serrata* n. sp. a maldanid polychaete from Porirua Harbour, New Zealand.—New Zealand Journal of Marine and Freshwater Research 11(4):697–702.

Langerhans, P. 1880. Die Wurmfauna von Madeira.—Zeitschrift fur Wissenschaften Zoologie, Leipzig 34:513–592.

Malmgren, A. J. 1865. Nordiska Hafs Annulater.—Öfversigt af Konglia Vetenskaps Akademiens Förhandlingar Stockholm 2:181–192.

Mangum, C. P. 1962. Studies on speciation in maldanid polychaetes of the North American Atlantic coast. I. A taxonomic revision of three species of the subfamily Euclymeninae.—Postilla 65:1–12.

———. 1966. Two new species of *Clymenella* (Polychaeta: Maldanidae) from Brazil.—Postilla 104: 1–10.

McIntosh, W. C. 1915. A monograph of the British marine annelids.—Ray Soçiety, Dulau and Co. Ed. 3:217–229.

Monro, C. C. A. 1930. Polychaete worms.—Discovery Reports, Cambridge 2:1–122.

———. 1939. B.A.N.Z. Antarctic Research Expedition 1929–1931.—Part 4 Polychaeta. B.A.N.Z.A.R. Expedition Committee 4(4):89–156.

Pillai, T. G. 1961. Annelida Polychaeta of tambalagam Lake, Ceylon.—Ceylon Journal of Sciences 4:1–40.

Verrill, A. E. 1900. Additions to the Turbellaria, Nemertia and Annelida of the Bermudas with revisions of some New England genera and species.—Transactions of the Connecticut Academy of Arts and Sciences 4(2):595–672.

Wesenberg-Lund, E. 1949. Polychaetes of the Iranian Gulf.—Danish Scientific Investigations in Iran 4:347–400.

Wolf, P. S. 1984. Maldanidae. Pp. 1–21 *in* J. M. Uebelacker and P. G. Johnson, eds., Taxonomic guide to the polychaetous annelids of the northern Gulf of Mexico. Barry A. Vittor and Associated, Mobile, Alabama 2(15):1–21.

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